Early

IC 103 = Disc.

501-374

PRELIMINARY SERVICE MANUAL

ACT-T-16K

REGENCY ELECTRONICS INC.

7707 Records Street

Indianapolis, Indiana
46226

4-78

0300-1203-300

ALIGNMENT PROCEDURE

EQUIPMENT REQUIRED

FM Signal Generator
AC Voltmeter, capable of measuring 455 KHz
Frequency Counter
DC Voltmeter, preferably digital type

A. MIXER BOARD ALIGNMENT

NOTE: Mixer board alignment should not be performed unless a problem with the 100 MHz oscillator is suspected.

Turn the Squelch Control to minimum (open squelch).

1. Pre-set the core of L501 to flush with the top of the coil form.

2. Turn the receiver off, then on. Touch MAnual.

3. Turn the core of L501 clockwise into the coil form until the receiver unmutes (squelch noise is heard).

4. Turn the core an additional 2 1/2 turns into the coil.

1. Enter MA; 9; CL. Check 9.5V regulated supply. If necessary, adjust R534 for 9.50 to 9.55 volts. This voltage is factory adjusted with a digital voltmeter and should not require readjustment.

2. Enter 177.8 MHz into Channel 1. Check board number before performing Step 3.

3A. Adjust L401 (yellow coil) for 1.0 to 1.1 volt reading on Pin 7 of IC401 on board number 700-412 (one IC).

3B. Adjust L401 (yellow coil) for 1.0 to 1.1 volt reading on Pin 6 of IC402 on board number 700-452 (two IC's).

4. Enter 146.0 MHz into a channel.

   a. On board number 700-412, the voltage at Pin 7 of IC401 should be between 7.4 and 7.8.

   b. On board number 700-452, the DC voltage at Pin 6 of IC402 should be between 8.4 and 8.9.

C. LOW BAND RF AND IF ALIGNMENT

1. Enter 39.9 MHz into Channel 1.

2. Accurately set the Signal Generator to 39.9 MHz (no modulation) and connect it's output to the receiver antenna input jack.

3. Adjust L312, L303, L302 for maximum AC voltage at Pin 5 of IC301.

4. Modulate the Signal Generator with 1000 Hz, 3.0 KHz deviation. Adjust L314, (quadrature coil), for maximum recovered audio.

5. Check the sensitivity at 33.1 MHz and 46.1 MHz to see that both are within specifications, (see Operator's Manual).

D. HIGH BAND VCO BUFFER ALIGNMENT

1. Enter 470.1 MHz into Channel 1.

2. Enter 440.1 MHz into Channel 2.

3. Enter 511.1 MHz into Channel 3.

4. Put unit on Channel 1.

5. Set Signal Generator to 470.1 MHz and adjust L311 for MINIMUM DC voltage at the emitter of Q307.

6. Check Q307 emitter voltage on Channels 2 and 3. The voltage should be balanced within .05 volts. If necessary, slightly retouch L311 for proper balance.

E. HIGH BAND RF

1. Enter 159.7 MHz into Channel 4.

2. Enter 146.1 MHz into Channel 5.

3. Enter 172.7 MHz into Channel 6.

4. Put unit on Channel 4.

5. Set Signal Generator to 159.7 MHz and adjust L305, L306, and L307 for maximum voltage at Pin 5 of IC301.

6. Check the sensitivity at 146.1 MHz and 172.7 MHz to see that both are within specifications, (see Operator's Manual).

F. UHF BAND RF

1. Put unit on Channel 1 (470.1 MHz).

2. Set Signal Generator to 470.1 MHz and adjust C325, C326, and C338 for maximum voltage at Pin 5 of IC301.

3. Check the sensitivity at 440.1 MHz, (Channel 2) and 511.1 MHz, (Channel 3) to see that both are within specifications (see Operator's Manual).

G. NETTING PROCEDURE

1. Program any channel to 162.000 MHz.

2. Connect the input of a Frequency Counter to the Junction of C343 and the base of Q308 on the receiver board.

3. Adjust C133 for a frequency of 151.300.

ACT-T-16K TONE ADJUSTMENT & TEST PROCEDURE

With Channel 16 programmed 162.00 MHz and 3 KHz deviation on Signal Generator:

A. Input level check @ C101 (blue wire)

1. 1050 Hz = .6 v peak or greater
2. 2000 Hz = .5 v peak or greater

B. Frequency adjustment - 2000 Hz

1. Place scope probe on Pin 8 of IC101.
2. Peak R114 for maximum (greater than .8 v peak).
3. Vary audio input frequency plus and minus approximately 50 Hz to make sure peak is centered at 2000 Hz.
   a). If not centered, shunt R118 with between an 18K to 10K resistor to obtain maximum output at 2000 Hz.
4. Check deviation level at which tone mutes receiver.
   a). 1.5 KHz to 3 KHz

C. Frequency adjustment - 1050 Hz

1. Place scope probe on Pin 14 of IC101.
2. Peak R103 for maximum (greater than .8 v peak).
3. Vary audio input frequency plus and minus approximately 50 Hz to make sure peak is centered at 1050 Hz.
   a). If not centered, shunt R105 with between an 18K to 10K resistor to obtain maximum output at 1050 Hz.
4. Enter: 2; .; CH. 1
5. Check deviation level at which tone "alerts" CH. 16.
   a). 1.5 KHz to 3 KHz.

RECEIVER BOARD

Voltages taken with Digital Voltmeter Scanner locked on Channel 1, NO signal applied.

	E	B	C
Q301	3.4	2.7	0
Q302	3.9	3.2	0
Q303	3.4	2.7	0.1
Q304	3.9	3.2	0
Q305	4.0	3.3	0
Q306	3.9	3.2	0.1
Q307	2.6	3.5	1.0
Q308	4.0	3.9	0
Q309	0	0.7 unsq. 0.0 sq.	0.1 0.7
Q310	0	0.1 unsq. 0.7 sq.	0
Q311	5.0	8.8	0
Q312	0	0	0.7 unsq. 0 sq.
Q313	1.3	2.0	4.6

IC301	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	9.5	8.8	9.1	9.5	1.1	1.1	1.1	9.5	1.6	3.5	2.1	2.6	0.7	0.7	0	2.1

IC302																
	8.1	1.4	0	0	0	1.4	0	8.9	0	0	0	8.2	16.2			

VCO BOARD

	E(S)	B(G)	C(D)
Q401 (FET)	2.4	0	8.3
Q402	2.0	2.5	8.3
Q403 (FET)	2.3	2.3	9.3

IC401	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	8.1	8.1	0.4	9.3	2.3	2.3	3.6	8.1	5.0	5.0	0	4.4	4.4	5.1

IC115	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	0.2	0.2	4.3	4.34	0.1	0.2	0	0.2	5.0	0.1	0.1	4.3	0.2	5.0

IC116	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	0.2	0.2	4.3	4.3	4.3	0.1	0	0.2	5.0	4.7	0.1	4.3	4.3	5.0

IC117	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	0.1	0.2	4.3	4.3	0.2	4.3	0	0.2	4.3	4.3	3.4	1.0	1.0	5.0

IC118	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	0.2	1.0	3.3	3.3	1.0	1.0	0	0.2	0.2	4.3	4.3	0.2	0.2	5.0

IC119	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	5.0	2.1	4.8	5.0	0	5.0	5.0	0	3.4	5.0	4.3	4.3	2.6	4.4	1.0	5.0

IC120	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	2.2	0	0	0	5.0	0	0	2.2	2.2	0	2.0	2.0	0.4	2.2

IC121	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	1.5	0	0	0	5.0	0	0	2.2	2.1	0	2.3	2.2	0	2.3

MIXER BOARD

	E	B	C
Q501	4.0	4.9	7.9
Q502	1.9	2.7	7.8
Q503	1.1	1.7	9.4
Q504	3.1	3.4	5.8
Q505	3.1	3.4	5.8
Q506	3.4	3.4	8.7

	1	2	3
IC501	16.3	1.5	9.5
IC502	11.2	0	5.0

LOGIC BOARD

	E	B	C
Q101	0	0	8.5
Q102	8.8	8.5	0
Q103	0	0	8.5
Q104	0	0	8.5
Q105	8.8	8.5	0
Q106	8.8	0	0
Q107	0	.3	8.5

IC102

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1.8	0.5	0.0	0.6	0	9.0	2.0	0	2.0	9.0	0	2.0	9.0	0	0	9.0

IC103

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
0.5	1.8	8.8	0	2.0	2.0	2.0	0.6	0.8	0.7	3.2	3.0	2.2	2.2	2.2	2.9	1.0	5.5	5.5	8.9	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5

IC104

1	2	3	4	5	6	7	8	9	10	11	12	13	14
4.3	4.3	0	5.0	0.8	4.3	5.0	4.3	0.2	0	0	0.1	5.0	5.0

IC105

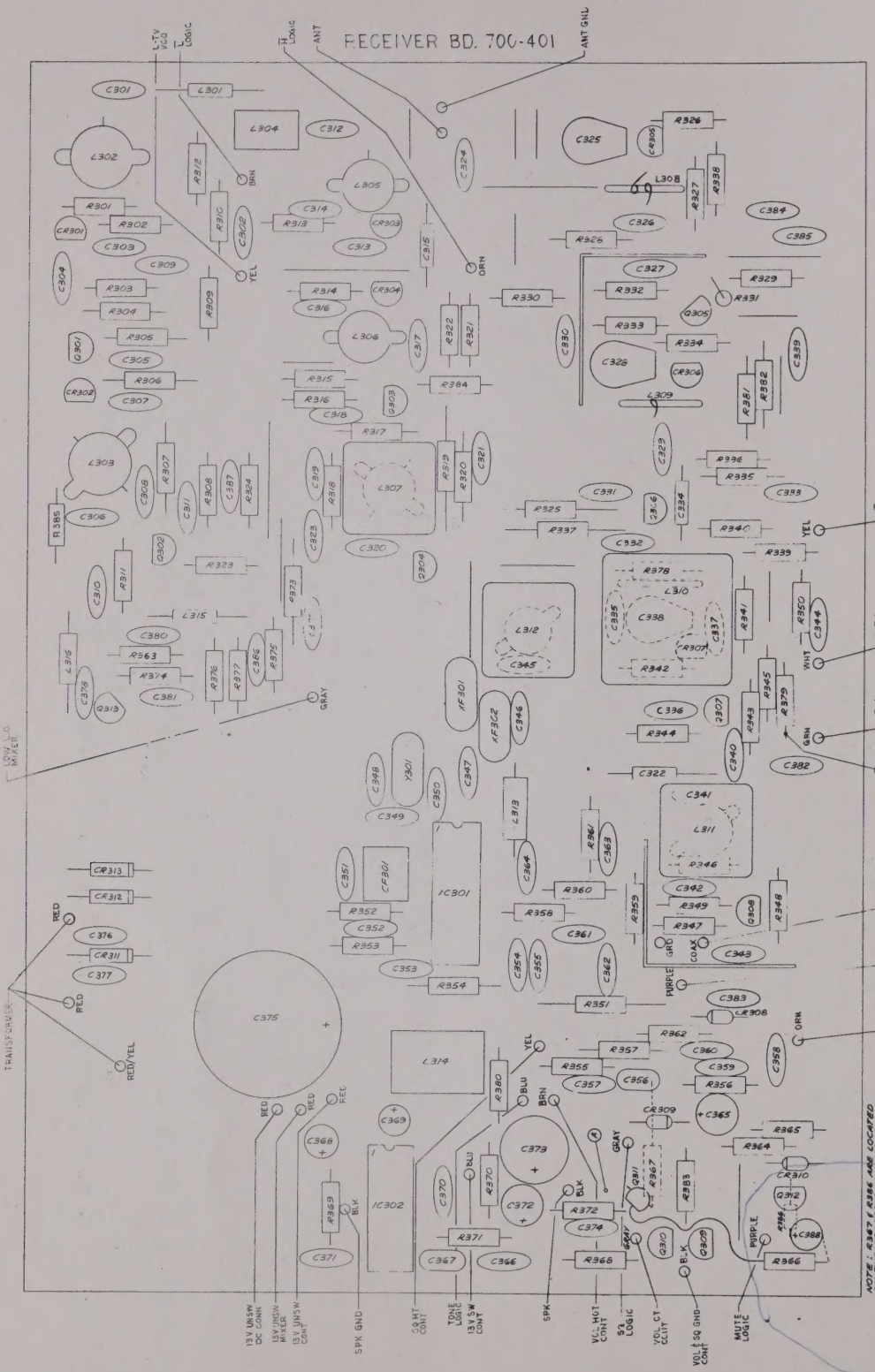
1	2	3	4	5	6	7	8	9	10	11	12	13	14
0.2	0.9	3.4	0.2	3.4	0.9	0	0	0.7	3.4	3.4	0.9	0.1	5.0

LOGIC BOARD (Continued)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IC106	4.3	0.2	0.2	0.2	5.0	1.8	0	4.3	4.3	0.1	1.3	1.3	0.1	5.0		
IC107	0.4	0.2	4.3	0.3	0.3	4.6	0	0.1	4.4	5.0	1.6	1.8	1.6	5.0		
IC108	1.2	1.2	1.8	1.8	5.0	0.9	0	0.2	1.9	0.1	1.8	1.0	5.0	5.0		
IC109	1.0	5.0	3.7	5.0	1.7	1.8	0	2.0	2.0	5.0	1.8	1.8	1.0	5.0		
IC110	1.6	0.9	0.9	5.0	1.8	1.8	0	3.7	0.2	5.0	0.2	1.8	1.0	5.0		
IC111	5.0	1.6	0.1	0.1	4.3	5.0	0.1	0	4.3	5.0	4.4	4.4	4.4	4.4	4.4	5.0
IC112	5.0	2.0	4.3	0.1	4.3	0.1	4.9	0	4.3	4.9	2.2	2.2	2.4	3.0	0.4	5.0
IC113	5.0	2.0	4.3	0.1	4.3	4.3	0.4	0	4.3	5.0	2.5	2.5	2.3	2.3	0.6	5.0
IC114	5.0	2.0	0.2	4.3	4.3	5.0	0.4	0	4.3	0.6	4.4	4.3	4.9	3.7	0.3	5.0
IC115	0.2	0.2	4.3	4.34	0.1	0.2	0	0.2	5.0	0.1	0.1	4.3	0.2	5.0		

FRONT PANEL

Pin	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IC201	3.4	4.2	0.5	0	0.5	5.0	0	0	3.8	0.5	9.0	0.5	4.6	0.6
IC202	5.5	5.2	0.5	0	1.8	0.9	0	0	4.2	0.5	9.0	0.5	5.7	0.5



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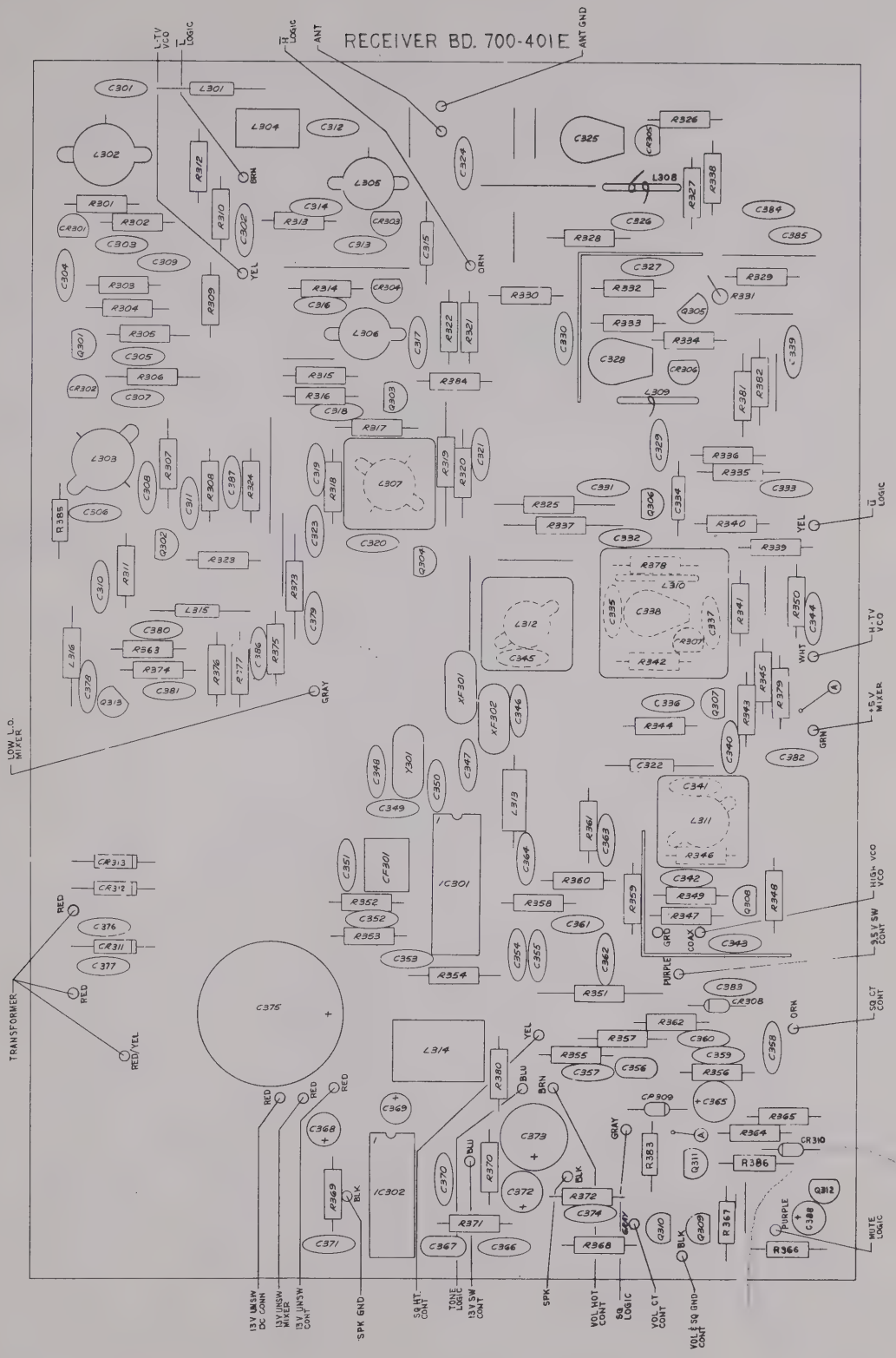

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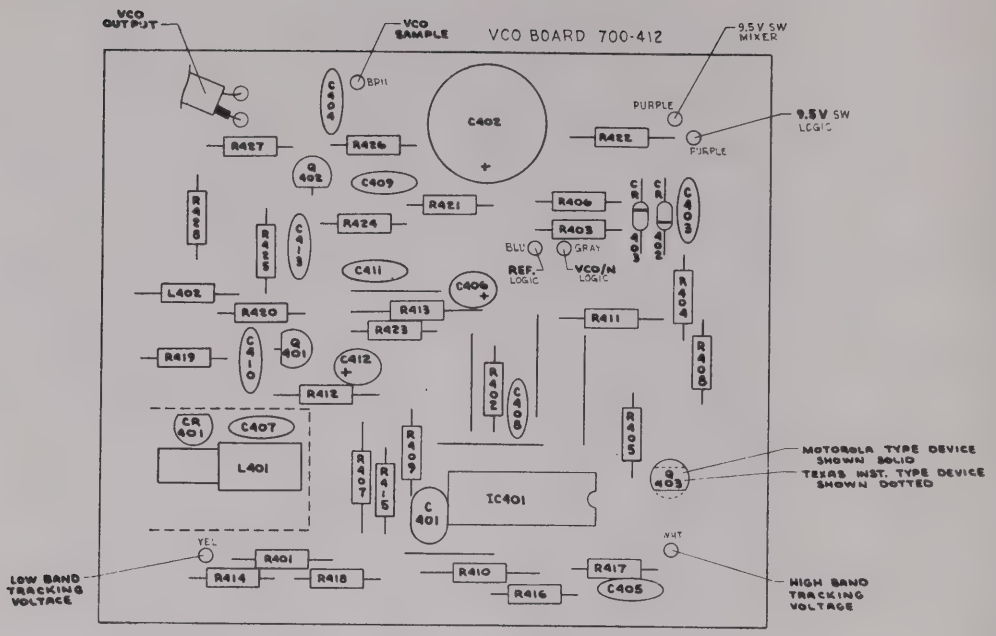

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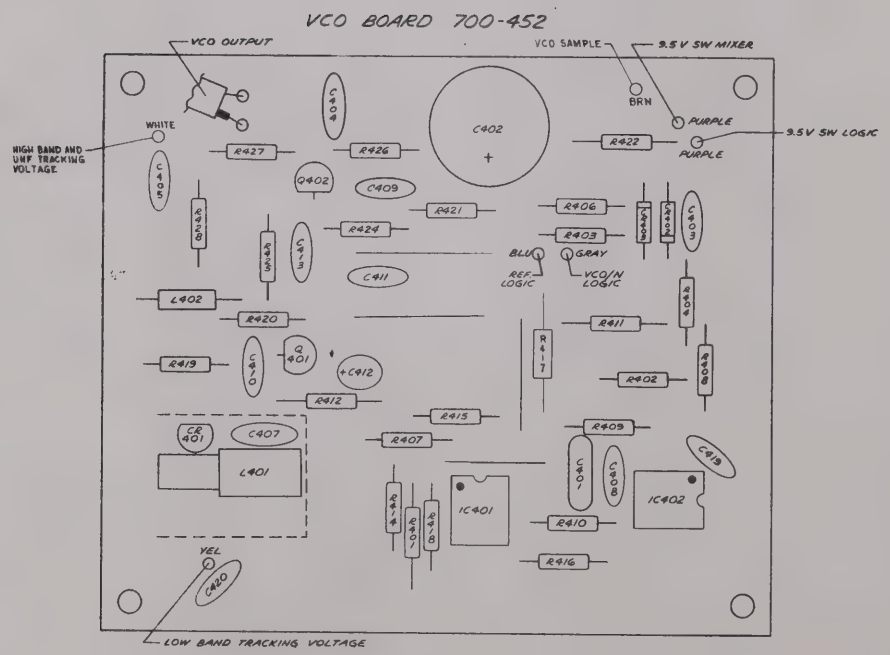

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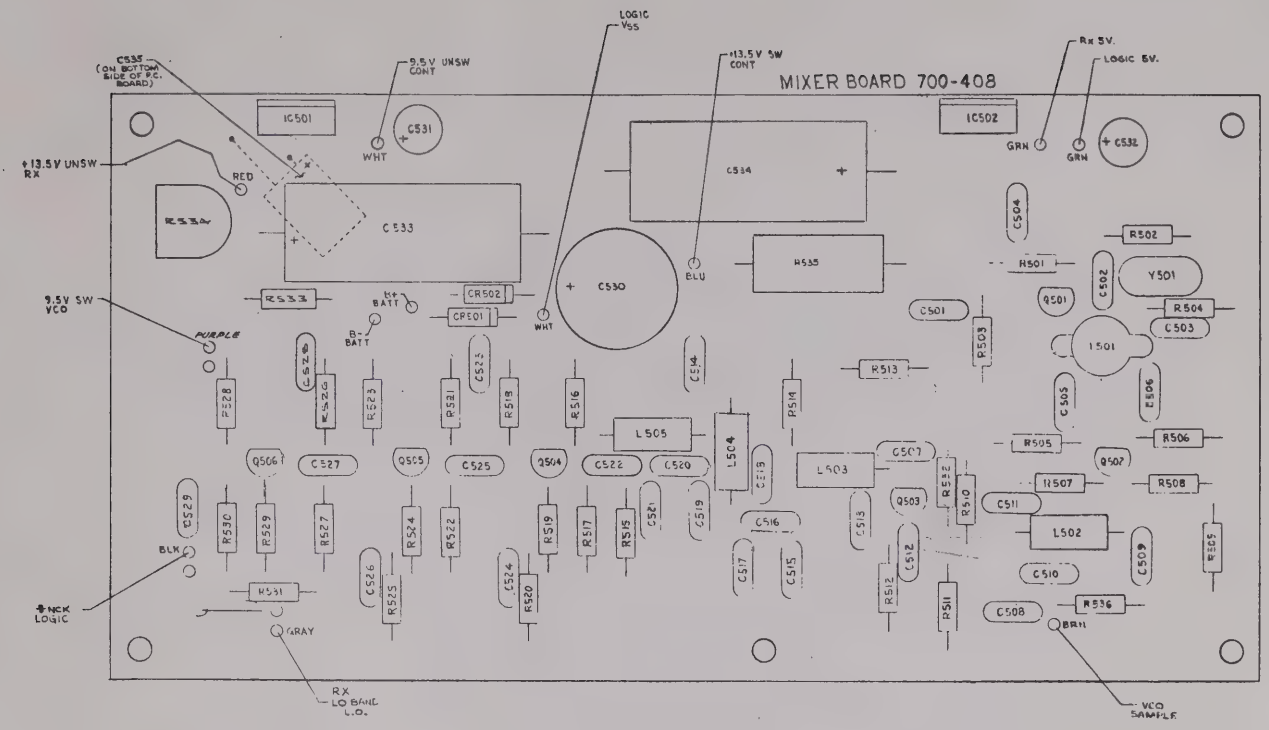

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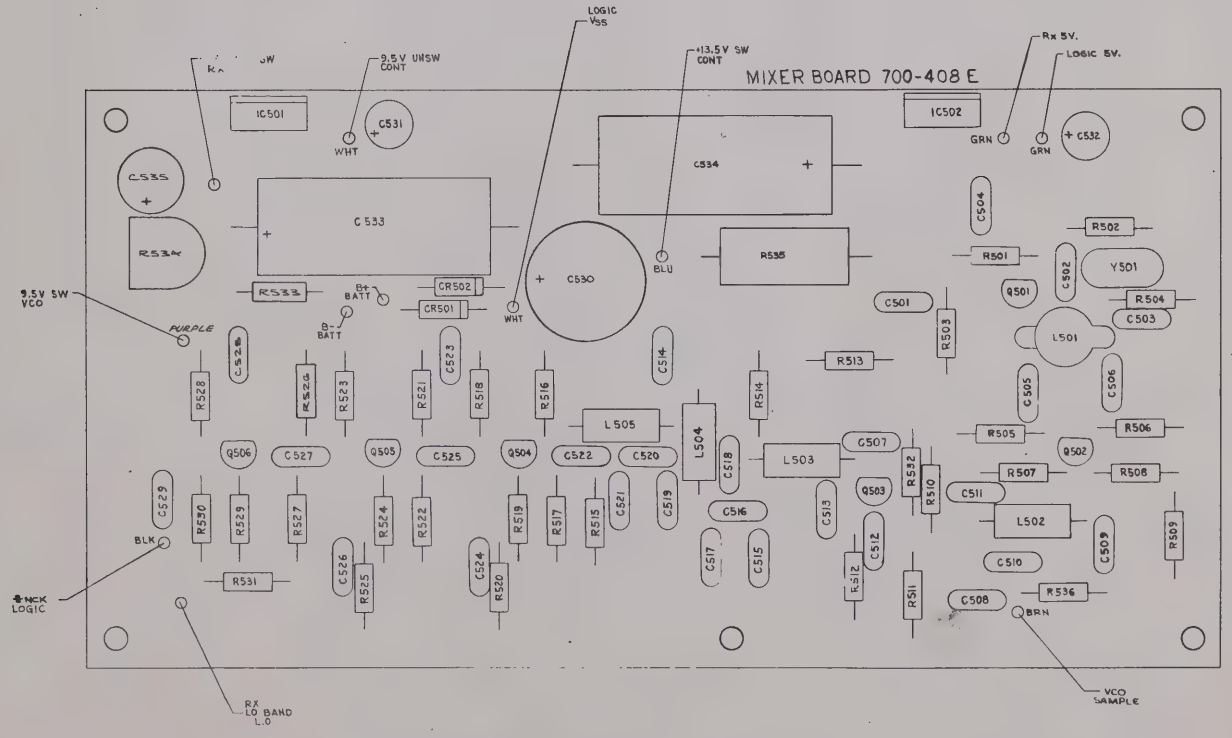

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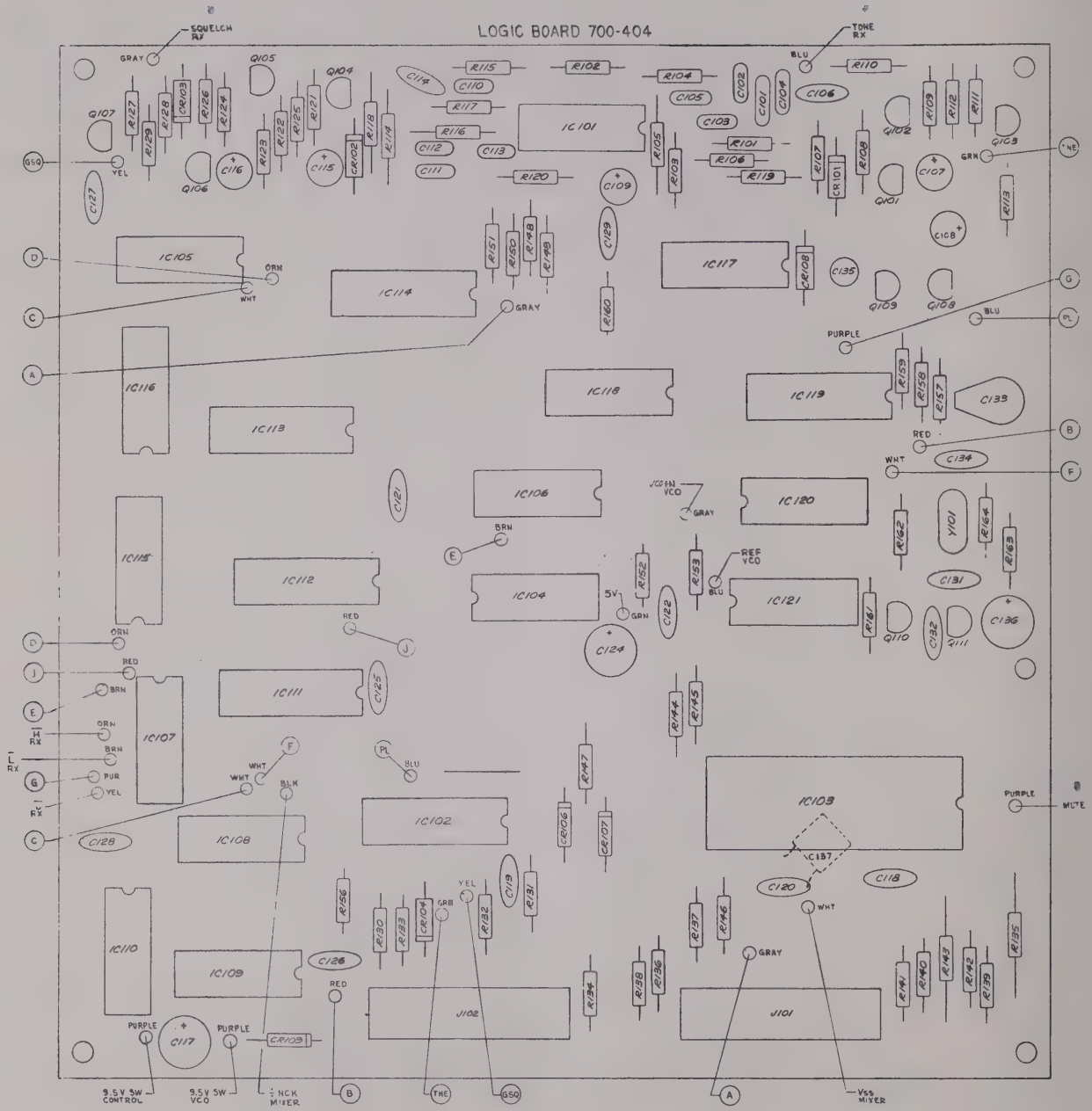

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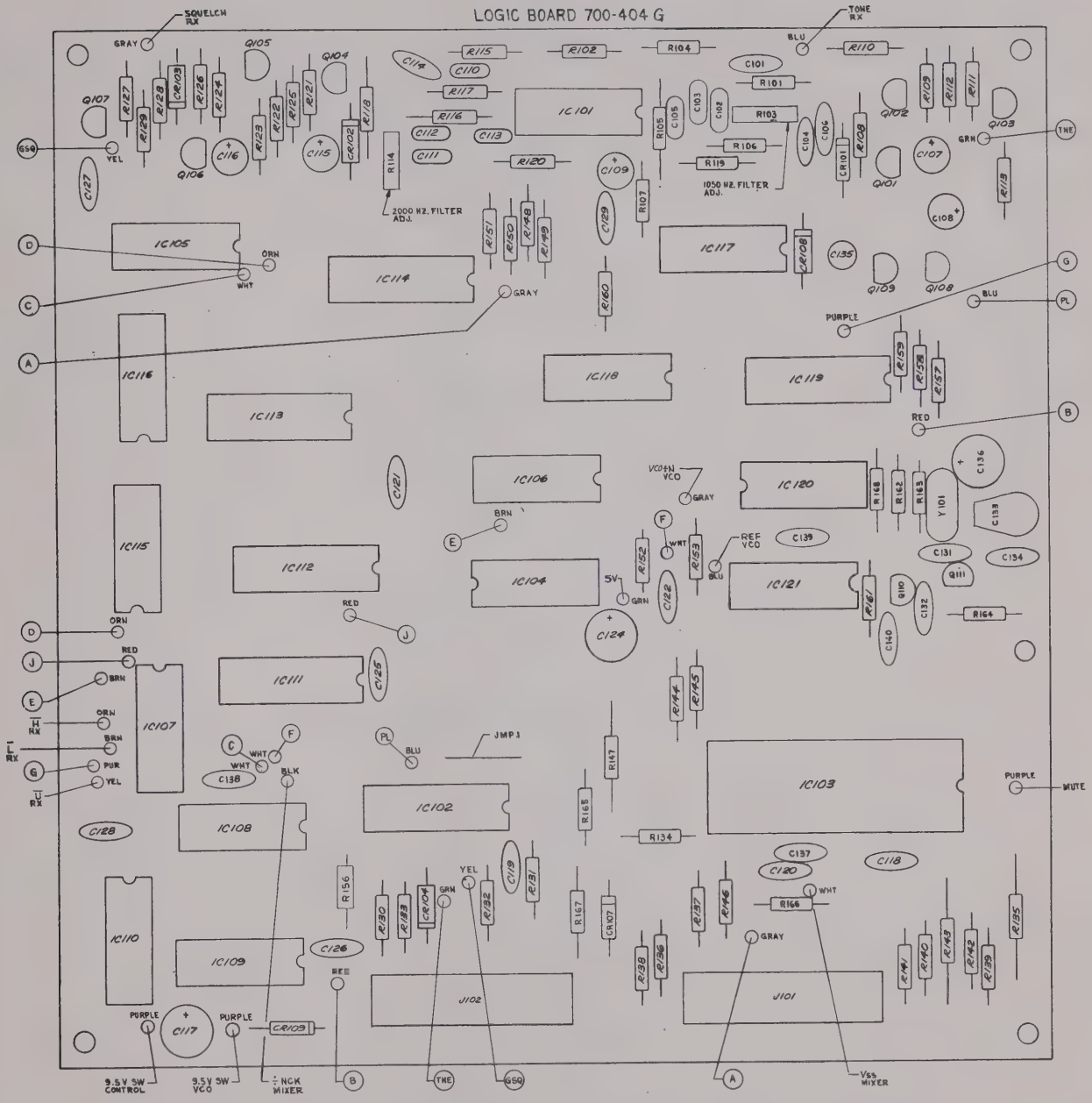
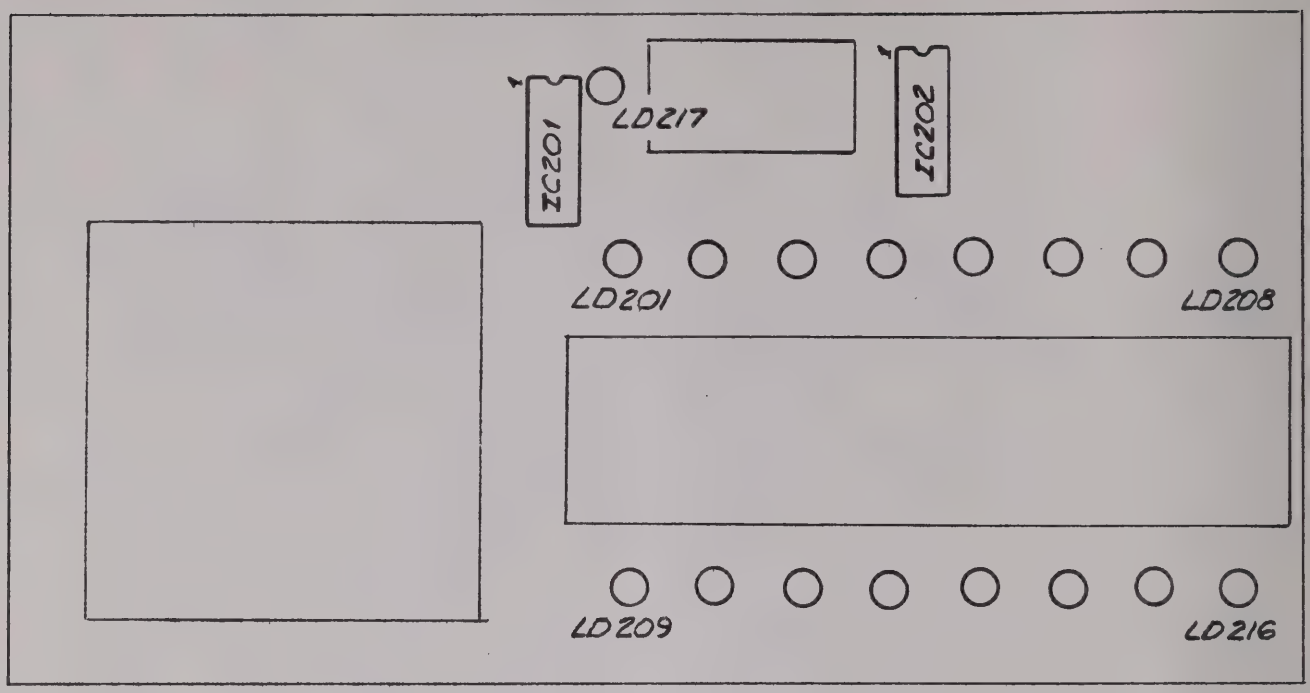
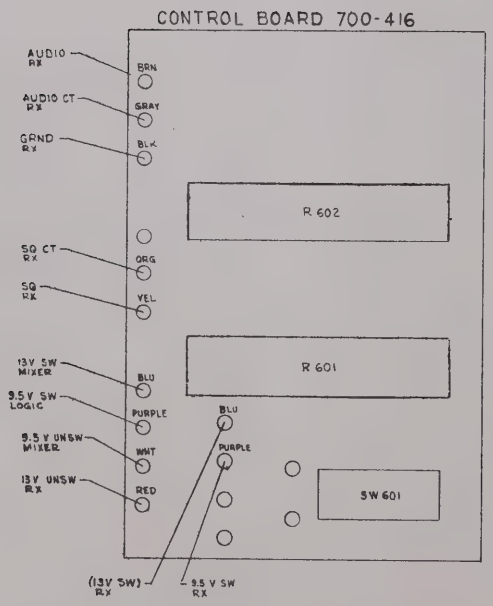


(LATER PRODUCTION UNITS)

KEYBOARD 700-394





ACT-T-16K PARTS LIST

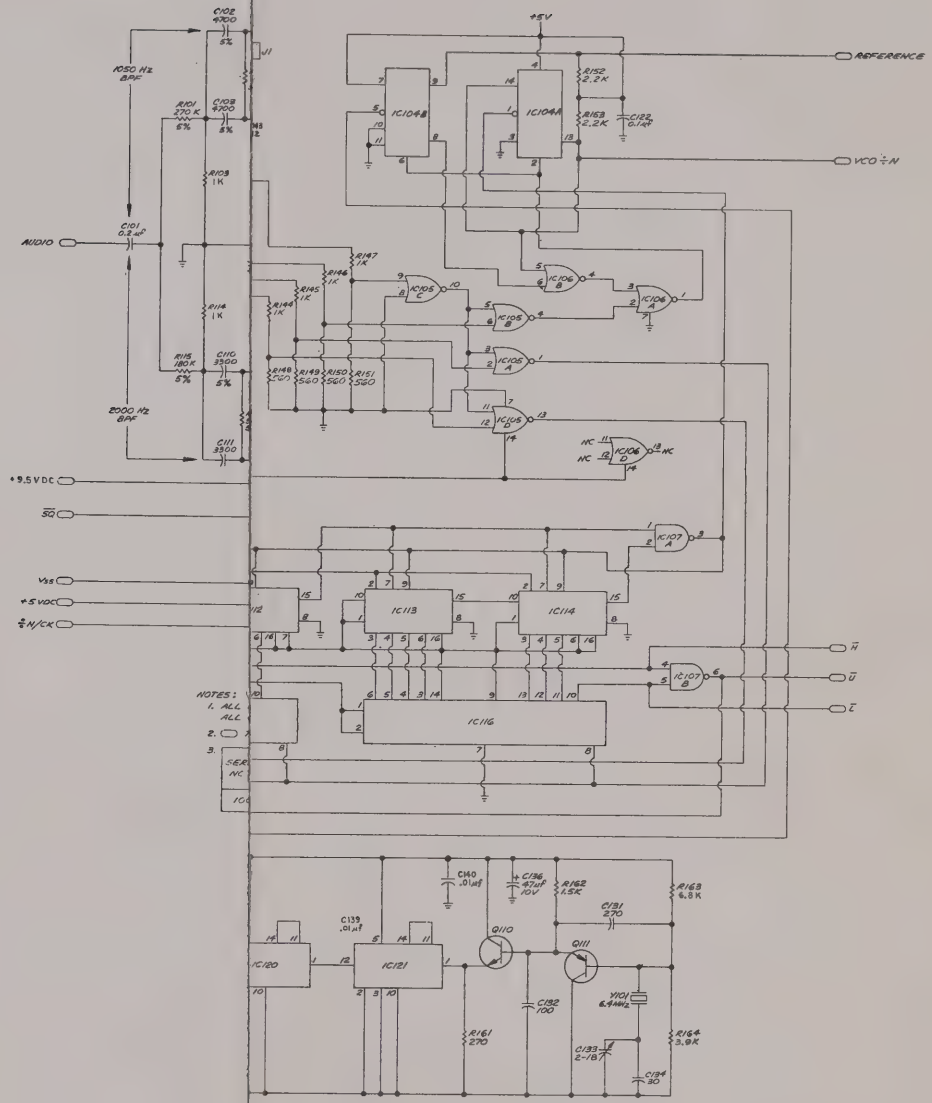
Item No.	Description	Part No.
	Integrated Circuits	
IC501	Regulator 8V	3130-0000-020
IC502	Regulator 5V	3130-0000-019
	Diodes	
CR501, 502	Silicon	4805-1241-200
	Coils	
L501	Oscillator, Orange	1800-3152-020
L502, 503	Choke, .18 uhy	1803-3268-204
L504	Choke, .11 uhy	1803-3268-203
L505	Choke, .085 uhy	1803-3268-202
	Resistors	
R534	Variable 500 Ohm	4751-0501-012
	Crystal	
Y501	Crystal, Ref., 100 MHz	2336-3273-700
	KEYBOARD ASSEMBLY	
	Display, LED 7 Digit	2700-5141-000
	Integrated Circuit	3130-3157-630
	Miscellaneous	
T1	Transformer, Power	5604-5142-400
SPKR1	Speaker, 8 Ohm, 2W	1301-3273-200
	Connector, DC	2105-1277-900
	Connector, AC	2105-1279-100
	Wrap Assembly	7011-1205-100
	Bumper, Rubber	1401-0000-003
	Front Panel	1411-7037-801
	Antenna	1201-5108-801

ACT-T-16K PARTS LIST

Item No.	Description	Part No.
	Resistors	
R103, 114	Variable, 2K	4751-0202-011
	Capacitors	
C133	Trimmer, 2.5-20 PF	1517-0000-034
	Crystal	
Y101	Reference, 6.4 MHz	2327-3250-000
	CONTROL BOARD	
R601	Control, Squelch, 100K Ohm	4752-5135-303
R602	Control, Volume, 100K Ohm	4752-5135-304
SW601	Switch, DPDT, OFF-ON	5113-5136-001
	VCO BOARD	
	Transistors	
Q401	FET	4811-0000-020
Q402	NPN (red top)	4801-0000-035
	Integrated Circuits	
IC401	Op Amp, 14 Pin (early versions) Op Amp, 8 Pin (later versions)	3130-3157-637 3130-3167-909
IC402	Op Amp	3130-3167-914
	Diodes	
CR401	Varactor	4809-0000-004
CR402, 403	Silicon, Signal	4805-1241-201
	Coils	
L401	Oscillator, Yellow	1800-5126-001
L402	Choke, 1.8 uhy	1802-0189-003
	MIXER BOARD	
	Transistors	
Q501, 502	NPN	4801-0000-100
Q503, 504 Q505, 506	NPN (red top)	4801-0000-035

ACT-T-16K PARTS LIST

Item No.	Description	Part No.
	RECEIVER BOARD	
Q301, 302, 303, 304, Q305, 306, 307, 308	PNP	4801-0000-026
Q309, 310, 312	NPN	4801-0000-010
Q311	PNP (white top)	4801-0000-060
Q313	NPN (red top)	4801-0000-035
	Integrated Circuits	
IC301	IF	3130-5127-100
IC302	Audio	3130-3157-629
	Diodes	
CR301, 302	Varactor	4809-0000-008
CR303, 304, 305 CR306, 307	Varactor	4809-0000-004
CR308, 309, 310	Silicon	4805-1241-200
CR311, 312, 313	Silicon, Power	4806-0000-004
	Coils	
L301	Choke, .68 uhy	1802-0688-003
L302	Ant, Low Band, Green	1800-5127-401
L303	RF, Low Band, Yellow	1800-5127-402
L304	Choke, .24 uhy	1803-5125-903
L305	Ant, Hi Band Primary, Brown	1800-3152-001
L306	Ant, Hi Band Secondary, Pink	1800-3152-002
L307	RF, Hi Band, Yellow	1800-3152-014
L308	Ant, UHF	1800-3255-201
L309	RF, UHF	1800-3160-005
L310	Multiplier, UHF	1800-3160-003
L311	Buffer	1800-3152-009
L312	10.7 IF, White	1800-3191-401
L313	Choke, 39 uhy	1803-3268-201
L314	Quadrature	1800-6055-801
L315, 316	Choke, .68 uhy	1802-0688-003
	Capacitors	
C325	Trimmer 2.5-20 PF	1517-0000-034
C328, 338	Trimmer, 2-6 PF	1517-0000-035


+5V
REFERENCE
VCO ÷N
AUDIO
+9.5 VDC
VSS
+5 VDC
÷N/CK
1050 Hz BPF
2000 Hz BPF
IC104B
IC104A
IC105
IC106
IC107
IC113
IC114
IC116
IC120
IC121
Q110
Q111
Y101 6.4 MHz
NOTES:

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Item No.	Description	Part No.
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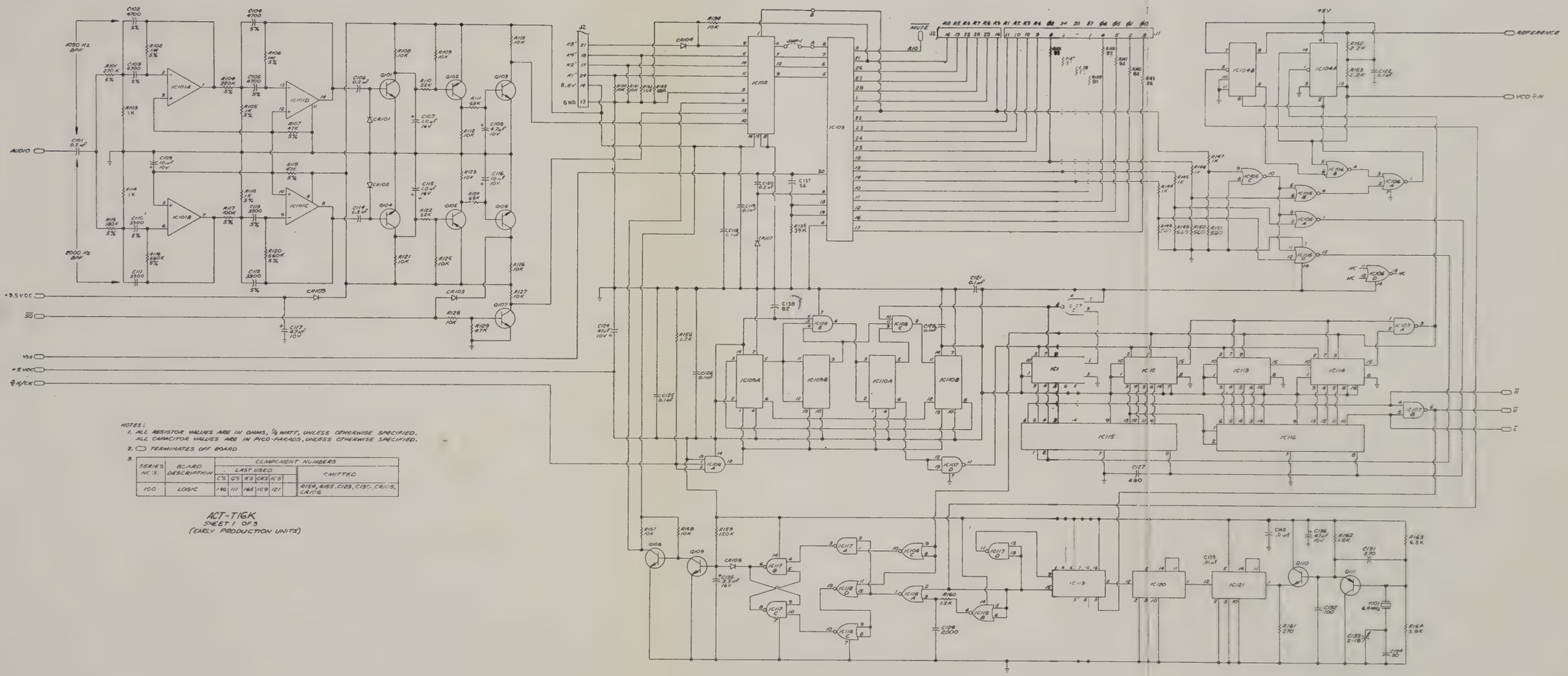
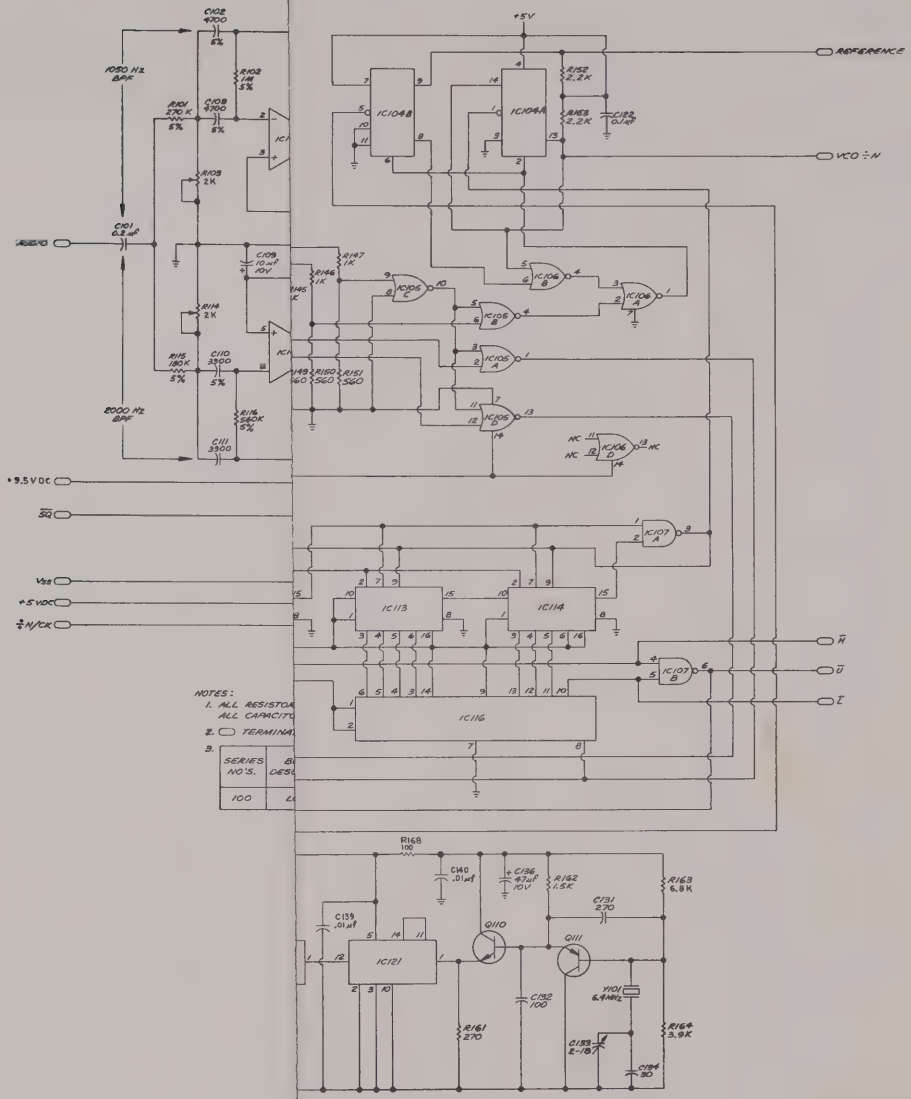
Q309, 310, 312	NPN	4801-0000-010
Q311	PNP (white top)	4801-0000-060
Q313	NPN (red top)	4801-0000-035
	Integrated Circuits	
IC301	IF	3130-5127-100
IC302	Audio	3130-3157-629
	Diodes	
CR301, 302	Varactor	4809-0000-008
CR303, 304, 305 CR306, 307	Varactor	4809-0000-004
CR308, 309, 310	Silicon	4805-1241-200
CR311, 312, 313	Silicon, Power	4806-0000-004
	Coils	
L301	Choke, .68 uhy	1802-0688-003
L302	Ant, Low Band, Green	1800-5127-401
L303	RF, Low Band, Yellow	1800-5127-402
L304	Choke, .24 uhy	1803-5125-903
L305	Ant, Hi Band Primary, Brown	1800-3152-001
L306	Ant, Hi Band Secondary, Pink	1800-3152-002
L307	RF, Hi Band, Yellow	1800-3152-014
L308	Ant, UHF	1800-3255-201
L309	RF, UHF	1800-3160-005
L310	Multiplier, UHF	1800-3160-003
L311	Buffer	1800-3152-009
L312	10.7 IF, White	1800-3191-401
L313	Choke, 39 uhy	1803-3268-201
L314	Quadrature	1800-6055-801
L315, 316	Choke, .68 uhy	1802-0688-003
	Capacitors	
C325	Trimmer 2.5-20 PF	1517-0000-034
C328, 338	Trimmer, 2-6 PF	1517-0000-035



NOTES:
1. ALL RESISTOR VALUES ARE IN OHMS, 1/4 WATT, UNLESS OTHERWISE SPECIFIED. ALL CAPACITOR VALUES ARE IN PICO-FARADS, UNLESS OTHERWISE SPECIFIED.
2. ▭ TERMINATES OFF BOARD

SERIES NO.	BOARD DESCRIPTION	COMPONENT NUMBERS						
		LAST USED						OMITTED
		CS	Q3	R3	CR5	IC3		
100	LOGIC	140	111	164	VC9	121		R154, R155, C123, C137, CR115, CR116

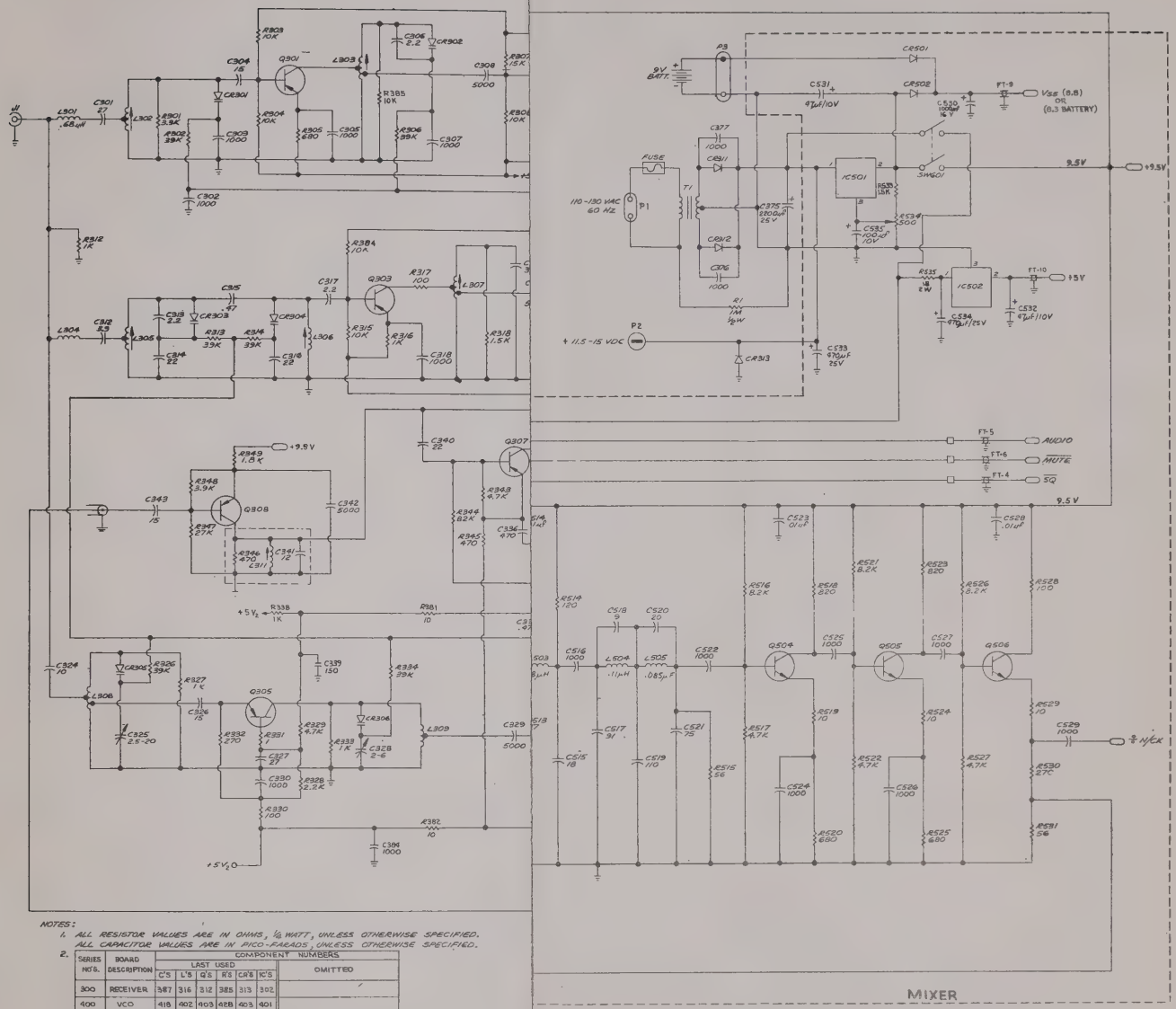
ACT-TIGK
SHEET 1 OF 3
(EARLY PRODUCTION UNITS)


+5V
REFERENCE
VCO ÷ N
1050 Hz BPF
2000 Hz BPF
AUDIO
+9.5 V DC
SQ
Vss
+5 VDC
N/CK
IC104B
IC104A
IC105
IC106
IC107
IC113
IC114
IC116
IC121
Q110
Q111
NOTES:
1. ALL RESISTOR
ALL CAPACITA
2. TERMINA
3.
SERIES NO'S.
100

NOTES:
1. ALL RESISTOR VALUES ARE IN OHMS, ⅛ WATT, UNLESS OTHERWISE SPECIFIED.
   ALL CAPACITOR VALUES ARE IN PICO-FARADS, UNLESS OTHERWISE SPECIFIED.
2. ◯ TERMINATES OFF BOARD
3.

SERIES NO.3.	BOARD DESCRIPTION	COMPONENT NUMBERS					
		LAST USED					OMITTED
		C's	Q's	R's	CR's	IC's	
100	LOGIC	190	111	167	109	121	R154, R155, C128, C130, CR105, CR106

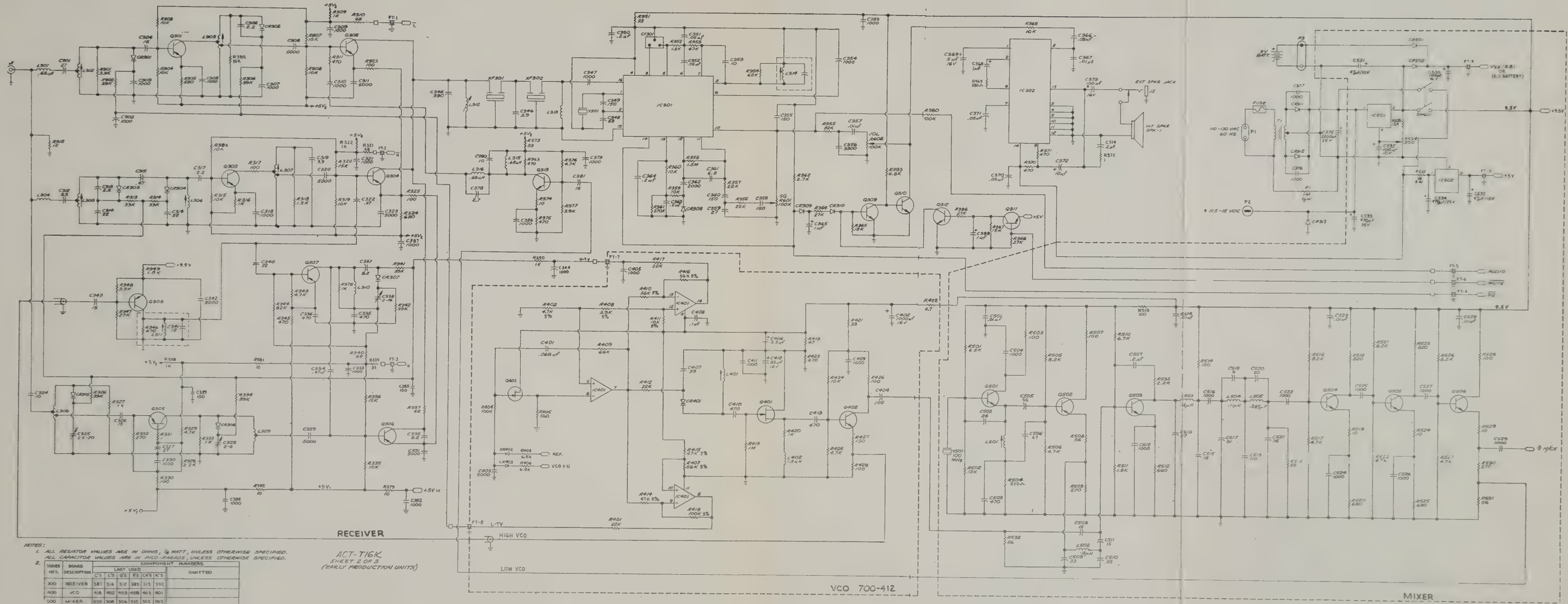
ACT-TIGK
SHEET 1& OF 3
(LATER PRODUCTION UNITS)



NOTES:

1. ALL RESISTOR VALUES ARE IN OHMS, 1/8 WATT, UNLESS OTHERWISE SPECIFIED. ALL CAPACITOR VALUES ARE IN PICO-FARADS, UNLESS OTHERWISE SPECIFIED.
2.

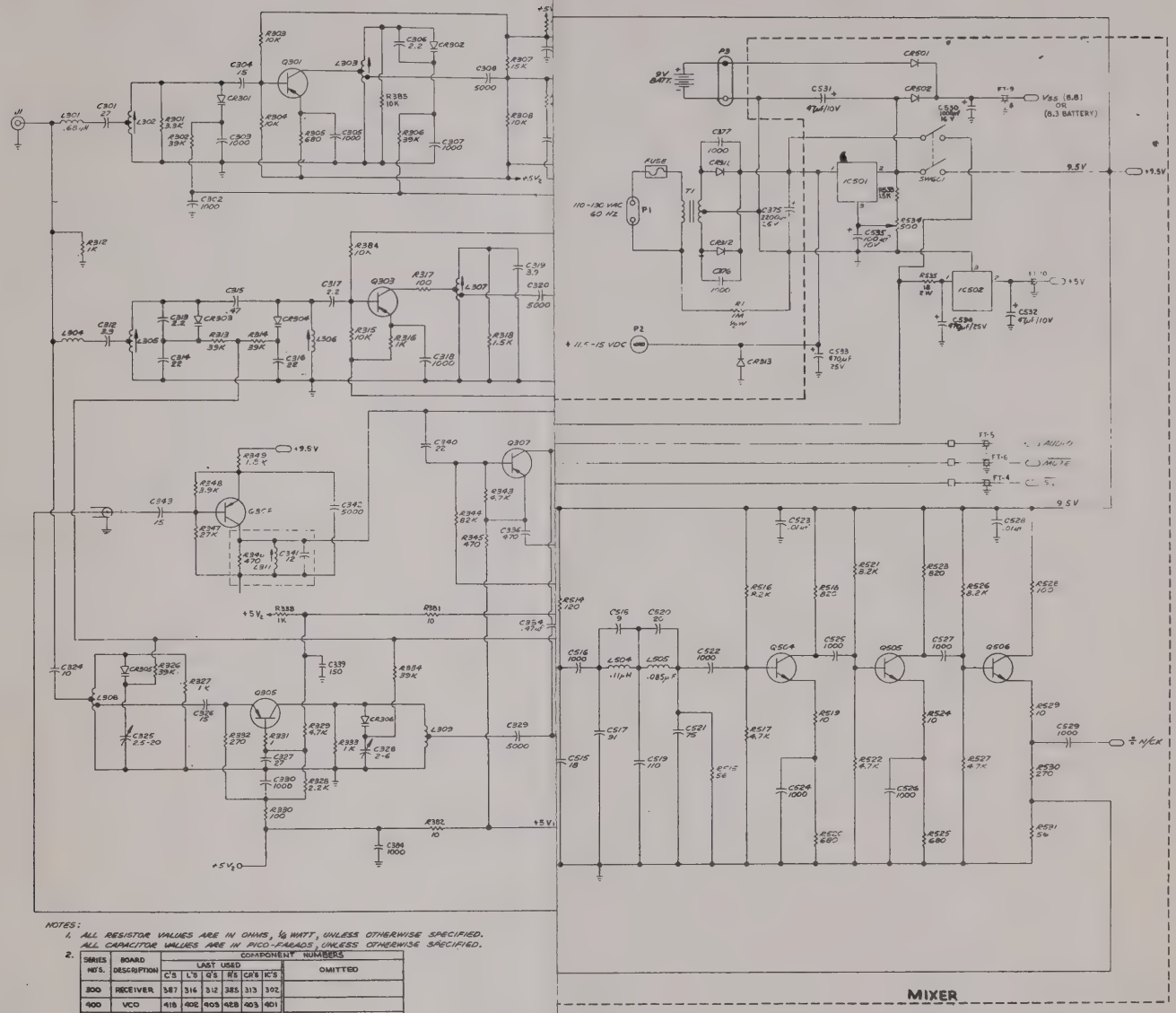
SERIES NOS.	BOARD DESCRIPTION	COMPONENT NUMBERS LAST USED C'S	L'S	Q'S	R'S	CR'S	IC'S	OMITTED
300	RECEIVER	387	316	312	385	313	302	
400	VCO	418	402	403	428	403	401	
500	MIXER	535	506	504	535	502	502	



NOTES:
1. ALL RESISTOR VALUES ARE IN OHMS, ¼ WATT, UNLESS OTHERWISE SPECIFIED.
   ALL CAPACITOR VALUES ARE IN MICRO-FARADS, UNLESS OTHERWISE SPECIFIED.
2.

SERIES REF. L	BOARD DESCRIPTION	COMPONENT NUMBERS LAST USED C's	L's	Q's	R's	CR's	IC's	OMITTED
300	RECEIVER	387	316	312	385	313	302	
400	VCO	418	402	403	428	403	401	
500	MIXER	535	506	506	535	502	502	

ACT-TIGK
SHEET 2 OF 3
(EARLY PRODUCTION UNITS)



NOTES:

1. ALL RESISTOR VALUES ARE IN OHMS, 1/2 WATT, UNLESS OTHERWISE SPECIFIED.
   ALL CAPACITOR VALUES ARE IN PICO-FARADS, UNLESS OTHERWISE SPECIFIED.
2.

SERIES NO'S.	BOARD DESCRIPTION	COMPONENT NUMBERS LAST USED						OMITTED
		C's	L's	Q's	R's	CR's	IC's	
200	RECEIVER	387	316	312	385	313	302	
400	VCO	418	402	403	428	403	401	
500	MIXER	535	508	504	535	502	502	

RECEIVER

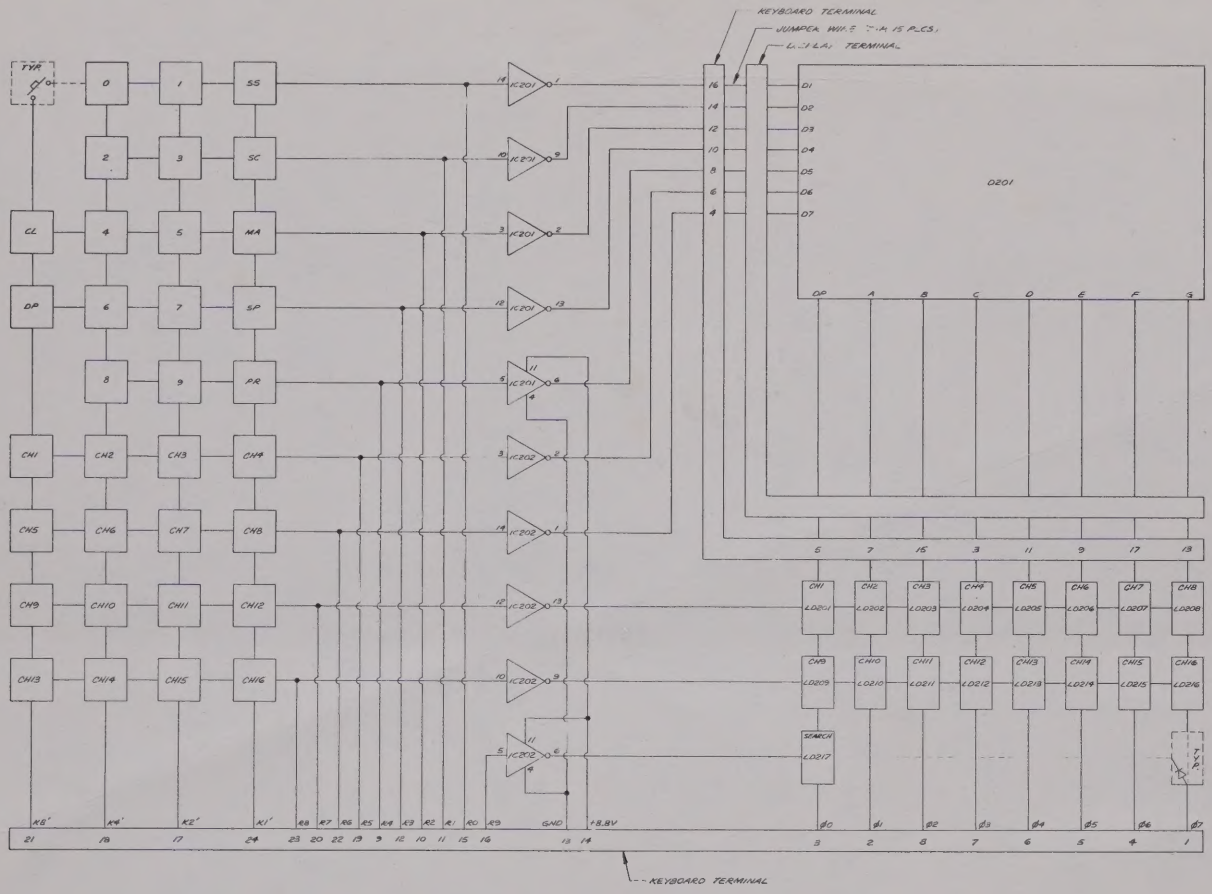
VCO 700-452

MIXER

ACT-TIGK
SHEET 28 OF 31
(LATER PRODUCTION UNITS)

NOTES:
1. ALL RESISTOR VALUES ARE IN OHMS, ½ WATT, UNLESS OTHERWISE SPECIFIED. ALL CAPACITOR VALUES ARE IN MICRO-FARADS, UNLESS OTHERWISE SPECIFIED.
2.

SERIES REF.	BOARD DESCRIPTION	COMPONENT NUMBERS LAST USED C'S	L'S	Q'S	R'S	CR'S	IC'S	OMITTED
300	RECEIVER	387	316	312	385	313	302	
400	VCO	418	402	405	428	405	401	
500	MIXER	535	508	504	535	502	502	


KEYBOARD TERMINAL
JUMPER WIRE TO H.S. P.C.B.
L.E.D. TERMINAL
TYR
0
1
SS
2
3
SC
CL
4
5
MA
DP
6
7
SP
8
9
PR
CH1
CH2
CH3
CH4
CH5
CH6
CH7
CH8
CH9
CH10
CH11
CH12
CH13
CH14
CH15
CH16
SEARCH
IC201
IC202
D201
D1
D2
D3
D4
D5
D6
D7
DP
A
B
C
D
E
F
G
LD201
LD202
LD203
LD204
LD205
LD206
LD207
LD208
LD209
LD210
LD211
LD212
LD213
LD214
LD215
LD216
LD217
K6'
K4'
K2'
K1'
K8
K7
K6
K5
K4
K3
K2
K1
K0
K9
GND
+8.8V
Ø0
Ø1
Ø2
Ø3
Ø4
Ø5
Ø6
Ø7
KEYBOARD TERMINAL